

CLAIMS

1. A sealing arrangement for sealing a leakage gap between relatively moveable parts in a flow path between a region of high fluid pressure and a region of low fluid pressure comprises a sealing member having an upstream surface, a downstream surface, a radially outer surface and a radially inner surface, said sealing member being in communication with a housing via resilient means

wherein the resilient means is fixedly joined to the upstream surface of the sealing member such that during operation both the radial force induced on the sealing member by fluid flowing axially into and circumferentially over the radially inner surface and the axial force induced on the sealing member because of a pressure difference across the sealing member is resisted by the resilient means.
2. A sealing arrangement as claimed in claim 1 wherein said radially inner surface of the sealing member is provided with a plurality of channels passing from the upstream surface to the downstream surface.
3. A sealing arrangement as claimed in claim 2 wherein the channels have a depth in the range of about 0.5 μ m to 10 μ m and a width in the range of about 0.1 mm to 15mm with an adjoining land approximately one third of the channel width.
4. A sealing arrangement as claimed in claim 2 wherein said plurality of channels have at least one change of direction.
5. A sealing arrangement as claimed in claim 2 wherein said plurality of channels are arcuate.

6. A sealing arrangement as claimed in claim 1 wherein said resilient means is formed as a cantilever.
7. A sealing arrangement as claimed in claim 1 wherein said housing is formed as a ring.
8. A sealing arrangement as claimed in claim 1 wherein said sealing arrangement is divided into a plurality of segments.
9. A sealing arrangement as claimed in claim 1 wherein said sealing arrangement is divided into a plurality of interconnecting segments.
10. A sealing arrangement as claimed in claim 8 wherein the resilient means is formed out of one or more elements per segment.
11. A sealing arrangement as claimed in claim 1 wherein the said sealing arrangement is disposed around a first rotatable member and fixedly joined to a static support structure.
12. A sealing arrangement as claimed in claim 11 wherein said first rotatable member is a shaft.
13. A sealing arrangement as claimed in claim 11 wherein said first rotatable member is a drum.
14. A sealing arrangement as claimed in claims 11 wherein during operation a clearance is maintained between the sealing member and the first rotatable member.
15. A sealing arrangement as claimed in claim 14 wherein the clearance is greater than about 1 μ m but less than about 5 μ m.

16. A sealing arrangement as claimed in claim 11 wherein the radially inner surface of the sealing member is formed such that in operation a clearance is maintained between the first rotatable member and the radially inner surface which is larger at the upstream end of the sealing member than it is at the downstream end.
17. A sealing arrangement as claimed in claim 16 wherein the radially inner surface is substantially parallel with an adjacent surface of said first rotatable member along at least part of the length of the radially inner surface.
18. A sealing arrangement as claimed in claim 11 wherein a circumferential flange is provided substantially towards the downstream end of the radially inner surface of the sealing member.
19. A sealing arrangement as claimed in claim 11 wherein the resilient means is configured such it produces a radially inward force on the sealing member which increases as the clearance between the radially inner surface of the sealing member and the first rotatable member increases.
20. A sealing arrangement as claimed in claim 1 wherein the sealing member is pierced providing at least one passage which extends from the upstream surface to the radially inner surface.
21. A sealing arrangement as claimed in claim 20 wherein the sealing member is configured such that the air passing through the at least one passage induces a radially outward displacement of the sealing member.
22. A sealing arrangement as claimed in claim 1 wherein a sealing means is provided between the downstream surface of the sealing member and the housing.
23. A sealing arrangement as claimed in claim 22 wherein the sealing means is formed as a radially resilient ring located in a circumferential groove provided in

the housing such that in operation the sealing means is in sliding contact with the housing and the sealing member.

24. A sealing arrangement as claimed in claim 22 wherein the sealing means is formed as a discontinuous ring.
25. A sealing arrangement as claimed in claim 22 wherein the sealing means is selected from at least one of a group of materials comprising steel alloys, nickel alloys, bronze, carbon graphite, silicon nitride, silicon carbide, zirconia, alumina, zialon and stellite.
26. A sealing arrangement as claimed in claim 1 wherein a sealing device is provided between the housing and the sealing member, said sealing device being positioned upstream of the downstream surface.
27. A sealing arrangement as claimed in claim 26 wherein the sealing device has a upstream surface and a downstream surface and provided with radially extending flanges in communication with the housing and the sealing member configured such that a tortuous route is provided between the upstream surface and the downstream surface of the sealing device such that there is a controlled but minimal leakage through the sealing device.
28. A sealing arrangement as claimed in claim 1 wherein the radially inner surface of the sealing member is provided with an erosion resistant surface.
29. A sealing arrangement as claimed in claim 28 wherein the radially inner surface of the sealing member is coated with at least one of the materials selected from a group comprising nitrided steel, carburised steel, hard anodised aluminium, tungsten carbide, chrome carbide, titanium carbide, titanium nitride.
30. A sealing arrangement as claimed in claim 1 for use in a gas turbine engine.